RJLG

Response of RJ Lee Group to EPA Region 9 (Meer) Letter dated March 9, 2006

Regarding Evaluation of EPA's Analytical Data from the El Dorado Hills Asbestos Evaluation Project

Exhibit C *1.2*

Preliminary presentation of the El Dorado data evaluation at the 2005 ASTM Johnson Conference

Date: July 2006

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Resuspension of Surface Dusts

RJ Lee Group, Inc.

Johnson 2005

Surface Dust Analyses

- To date, have focused on all (or as much as can be collected) on the surface
  - Typically includes non-respirable particles
- Procedures have involved indirect analyses of samples
  - Indirect preparation increases fiber counts through a combination of liberation and comminution

Surface Dust Analyses

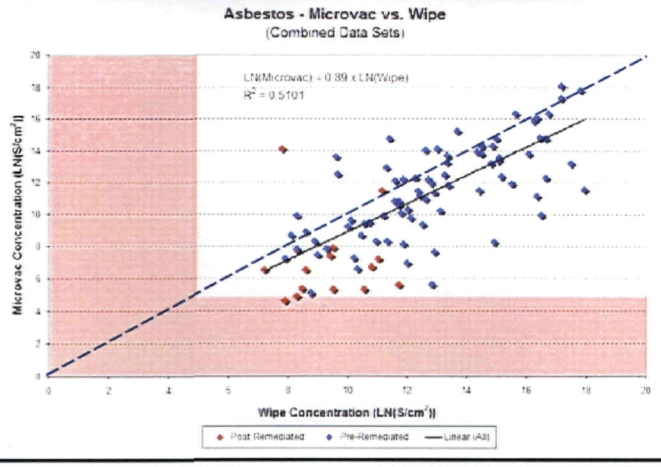
- Target procedure should:
  - Field usable
  - Focus on releasable particles
  - Particles that are respirable
    - Provides information that can be used for risk estimation

Field Sampling

- Unit must be portable
- Results must be correlated with other accepted procedures
- Desirable to study in-place materials
  - Avoids issues related to sample collection and transportation

How Do We Collect Valid Field Samples?

Comparison of Microvac and Wipe Sampling

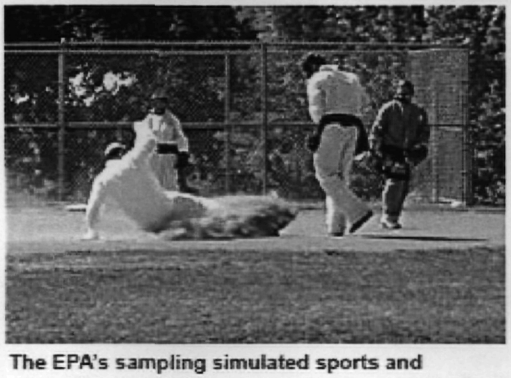


Field Sampling

The EPA's sampling simulated sports and recreational activities of both children and adults

El Dorado Hills, CA
Activity-based sampling

Field Sampling



The EPA's sampling simulated sports and recreational activities of both children and adults

El Dorado Hills, CA
Activity-based sampling

Issue – How reproducible is the testing?

Or, as one statistician said – If they played the game again, would the score remain the same?

What Was Sampled?

- 4726 Primary Structures
- 4901 Total Structures
- 2773 Amphibole Fibers (F, MF, CF)

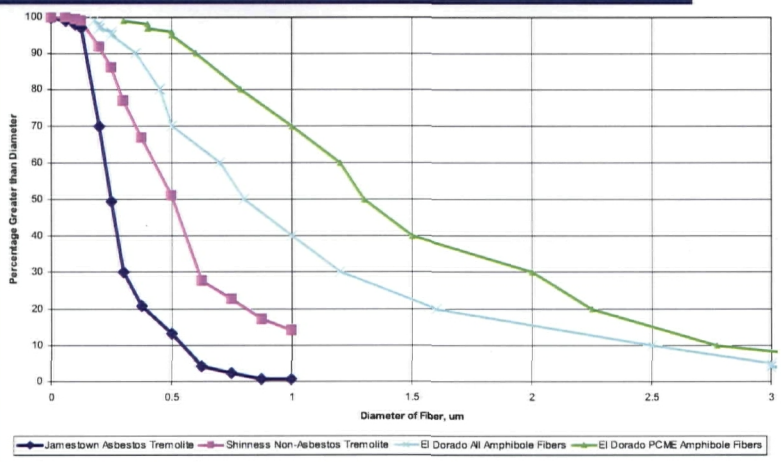
Parameter	Mean	Median
Length	6.6 µm	5.1 µm
Width	1.1 µm	0.8 µm
Aspect Ratio	7.1	5.8

What Was Sampled?

- 2773 Amphibole Fibers (F, MF, CF)
- 1485 Amphibole Fibers ≥ 5 µm long
- 1481 PCME Amphibole Fibers
- 16 Amphibole Fibers ≥10 µm long and ≤ 0.5 µm

Parameter	Mean	Median
Length	9.7 µm	8.0 µm
Width	1.6 µm	1.3 µm
Aspect Ratio	7.8	6.2

What Was Sampled?



Prior Processes

Field Sampling

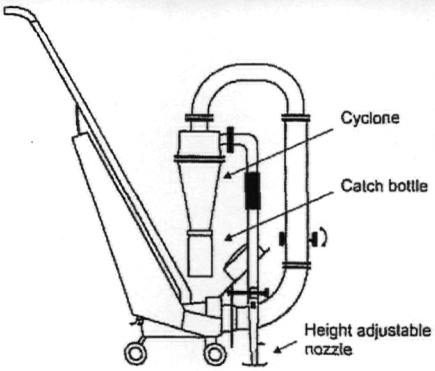


Fig. 2.3-3 HVS3 high-volume small surface sampler (Roberts et al , 1991)

T. Schneider, *Indoor Environ*, Chap 2.3, 2003

Field Sampling

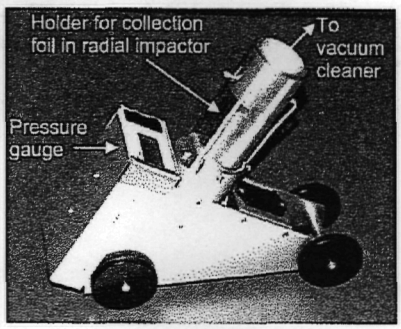


Fig. 2.3-4 Carpettester consisting of a suction nozzle (not visible), radial impactor with collection foil and connector to vacuum cleaner hose, and pressure gauge for adjusting vacuum cleaner flow rate (Schneider et al , 1992)

T. Schneider, *Indoor Environ*, Chap 2.3, 2003

Field Sampling

10 jets @ 45° to surface

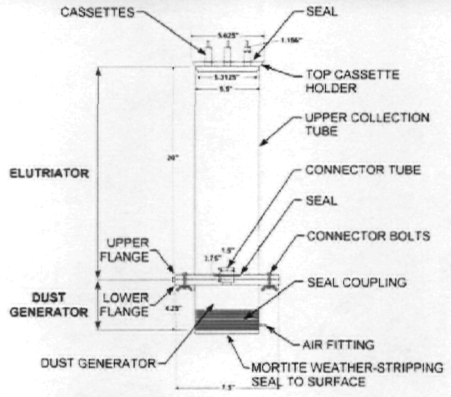
Fig 2.3-6 The P-FLEC sampler. The cell is pressed against the surface. Inside the cell a ring supporting and providing pressurized air to a tube with 10 holes rotates. The air jets impact at the surface at an angle of 45°. The removed dust can be collected on a filter or analyzed by a direct reading instrument (Kildesø et al., 2003)

T. Schneider, *Indoor Environ*, Chap 2.3, 2003

Portable Elutriator

- Multiple sample collection
  - Used for multiple analyses (fibers, metals, silica, organics)
- PM 10 sample size
- Loading limited (for fiber counting) to permit direct preparation

Portable Elutriator



ELUTRIATOR ASSEMBLY

Portable Elutriator

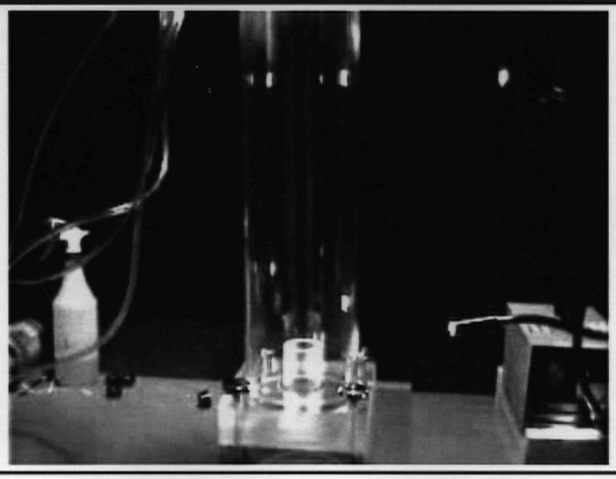
- Dust Generator Operation
  - Compressed Nitrogen gas, 25 psi, 8 lpm
  - Injected through four 3.5 mm diameter ports
  - Gas velocity at port – 8 mph
  - Pulsed for 1 second every 30 seconds
  - Remaining 29 seconds used filtered room air

Portable Elutriator

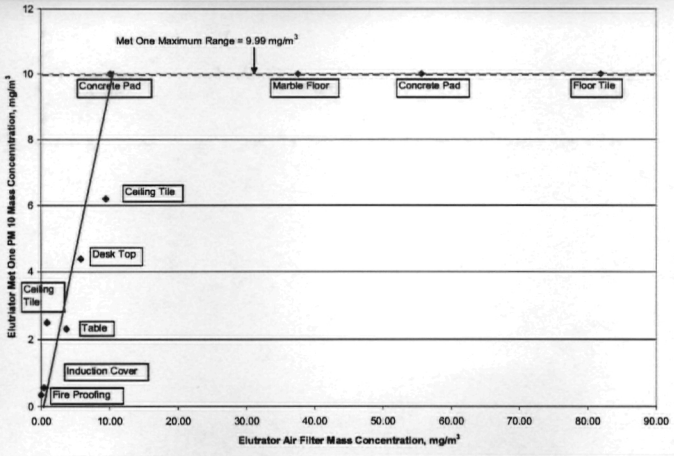
- Elutriator Assembly
  - Cross-section velocity about 0.45 cm/sec
  - Four pre-weighed 0.2 µm PC filters (25 mm) each operating at 1 lpm
- Of the collected particles, 98% were less than 10 µm in diameter.

Portable Elutriator

Portable Elutriator



Portable Elutriator



Comparison with Surface Concentrations

Dust Load Level	Respirable Pb in Air, $\mu g/m^3$	Pb on Surface Wipe, $\mu g/m^2$	Resuspension Effectiveness, $(\mu g/m^3)/(\mu g/m^2)$
Light	0.44	1744	2.5×10^{-4}
Medium	1.52	2530	6.0×10^{-4}
Heavy	9.02	9171	9.8×10^{-4}

Average Concentrations

Comparison with Surface Concentrations

Dust Load Level	Respirable Dust in Air, g/m^3	Dust on Surface Wipe, g/m^2	Resuspension Effectiveness, $(g/m^3)/(g/m^2)$
Light	0.0011	1.99	5.5×10^{-4}
Medium	0.0061	4.04	15.1×10^{-4}
Heavy	0.0387	24.63	15.7×10^{-4}

Average Concentrations

Comparison with Surface Concentrations

Dust Load Level	Respirable Asbestos in Air, s/cm^3	Asbestos on Surface Wipe, s/cm^2	Resuspension Effectiveness, $(s/cm^3)/(s/cm^2)$
Light	< 0.019	257,100	$<1.4 \times 10^{-7}$
Medium	0.40	799,400	5.0×10^{-7}
Heavy	2.69	6,738,000	4.0×10^{-7}

Average Concentrations, Air is Direct Preparation

Comparison with Surface Concentrations

Dust Load Level	Respirable Asbestos in Air, s/cm^3	Asbestos on Surface Wipe, s/cm^2	Resuspension Effectiveness, $(s/cm^3)/(s/cm^2)$
Light	0.094	257,100	3.6×10^{-7}
Medium	8.52	799,400	1.1×10^{-5}
Heavy	136.5	6,738,000	2.0×10^{-5}

Average Concentrations, Air is Indirect Preparation

Summary

- A field sampling device was developed with the following characteristics:
  - Multiple sample collection
    - Used for multiple analyses (fibers, metals, silica, organics)
  - PM 10 sample size
  - Loading limited (for fiber counting) to permit direct preparation
- Dust generation (mass) was validated against a real-time monitor

Summary

- Current testing is being conducted to improve the method.